Small Business Innovation Research/Small Business Tech Transfer

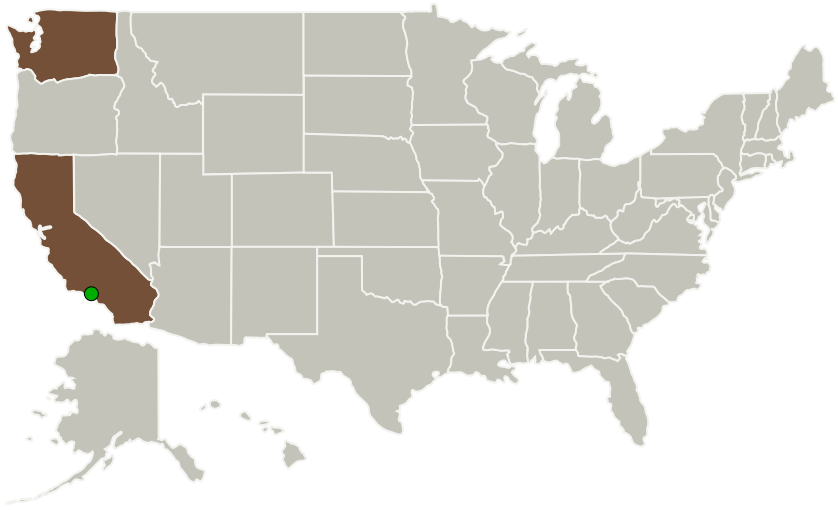
High Performance Thrusters for Advanced Green Monopropellants, Phase I

Completed Technology Project (2014 - 2014)

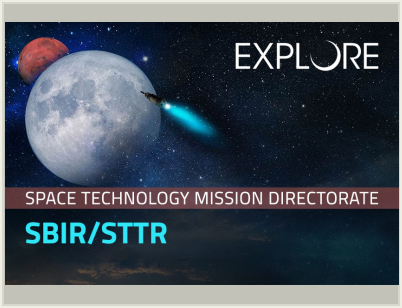
Project Introduction

The development of an advanced green monopropellant propulsion system could have significant benefits to a wide range of NASA space missions, from deep space satellites to manned space vehicles. However, the state-of-the-art thruster materials, refractory metals, cannot withstand AF-M315E combustion environment at temperatures of >2000°C without loosing their mechanical integrity. Sienna Technologies, Inc, in collaboration with Moog-ISP, proposes to develop a revolutionary refractory metal-ceramic FGM material and an AF-M315E advanced green monopropellant thruster. In Phase I we will demonstrate a refractory metal-ceramic FGM through materials design and microstructural control that meets the requirements for thrust chamber for AF-M315E monopropellant. In Phase II we will fine-tune the FGM material properties to maximize the mechanical strength and thermochemical stability; and design, fabricate, and test a working FGM thruster in collaboration with Moog-ISP.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Sienna Technologies, Inc.	Lead Organization	Industry	Woodinville, Washington
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California



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Primary U.S. Work Locations	
California	Washington

Project Transitions

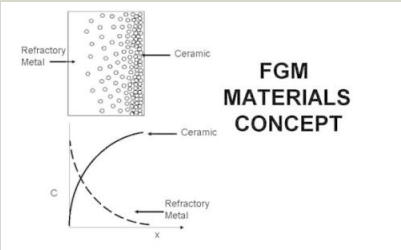
June 2014: Project Start

December 2014: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/137476)*

Images



Briefing Chart
High Performance Thrusters for Advanced Green Monopropellants, Phase I
(https://techport.nasa.gov/image/133727)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Sienna Technologies, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

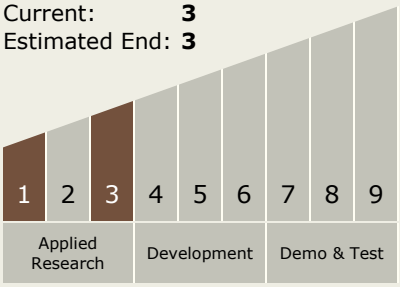
Carlos Torrez

Principal Investigator:

Ender Savrun

Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**



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Completed Technology Project (2014 - 2014)

Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.1 Chemical Space Propulsion
    - TX01.1.2 Earth Storable

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System